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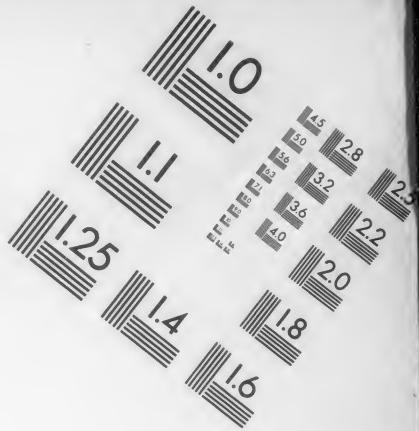
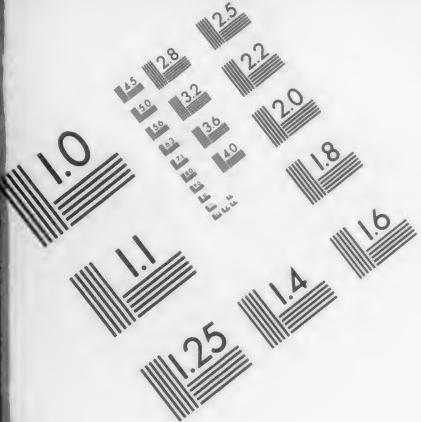


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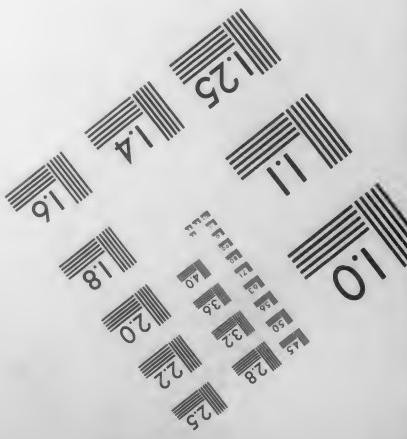
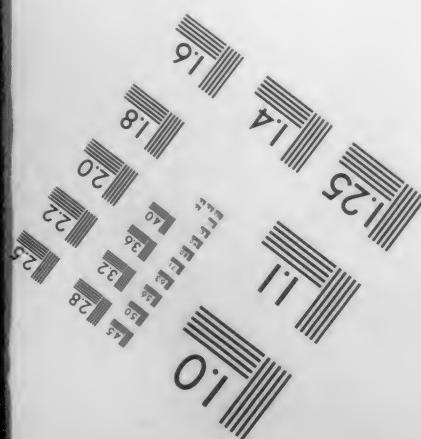
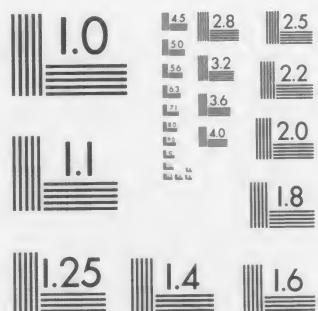
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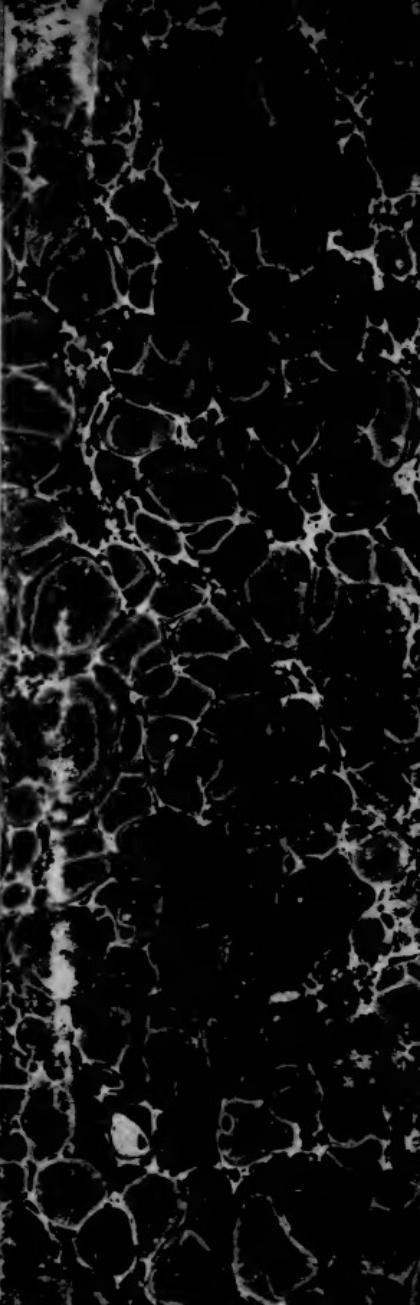


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Space and Time

A Critique on Herbert Spencer

By

Frank Preston Stearns

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Space and Time

A Critique on Herbert Spencer

BY

Frank Preston Stearns

The Knickerbocker Press, New York

HERBERT SPENCER
ON
SPACE AND TIME.

HERBERT SPENCER has developed his theory of space and time in some forty printed pages without coming to any very definite conclusion that I can discover, except that we derive our notions of them from experience, and that they are not, as Kant and Hamilton supposed, *a priori* cognitions or forms of thought. His statement has throughout the character of an argument rather than of an investigation; and Spencer would seem to have changed his opinion during the course of this, for on the third page of his chapter on space he says:

"If Space be an universal form of the *non ego*, it must produce some corresponding universal form in the *ego*—a form which, as being the constant element of *all* impressions presented in experience, and therefore of *all* impressions represented in thought, is independent of every *particular* impression";

and again on page 233:

"With such further reasons for holding that space is not a form of the *non ego* disclosed to us by experience,

we may be encouraged to continue that analysis of our perception of it collaterally entered upon in the last chapter."

This appears very much like a contradiction in terms, if not in fact. In the revised edition of his *Psychology*—now a rare book—he speaks of space as an "objective reality," and also as "an ability to contain bodies." He distinguishes between occupied and unoccupied space. He thinks time may be converted into space.

In regard to unoccupied space it may as well be said at once that we know nothing of it objectively. So far as the Milky-Way matter extends, and, who can tell what is beyond the universe? We do not even know what is beyond our atmosphere.

Experience may be either subjective or objective. Hunger is a subjective experience; cold an objective one. Life itself is an experience and yet life precedes all experience. Investigation of our mental faculties is an experience, and yet it is with these faculties that we make the investigation. Spencer evidently thinks that our experience of space and time is objective.

WHAT IS SPACE?

Following Shakespeare's suggestion that with a bait of error one may catch a carp of truth, and without carping at Mr. Spencer, who frequently uses this method himself, we may, perhaps, learn something of the true character or quality of space, by considering what is included in this dictum.

An objective reality has been frequently defined as an entity which is cognizable by the senses; and if this were not so, it is quite impossible to imagine how we should have experience of it,—how we could become conscious of it. Now which of the senses brings us into relation with the objective reality called *space*? We certainly do not smell space; neither do we taste it, nor hear it. The question remains whether we can feel it or see it. In order to feel an object, however, it must have consistency, or weight; in order to see an object it must have color. This is a proposition which there is no disputing. Now has any physicist ever succeeded in weighing space; has any artist succeeded in painting a reproduction of it? But the Spencerian replies that if we cannot see space we can see into it and through it; if we cannot feel space, as we do a brick wall, we can feel the spaces on the wall marked by the bricks with our eyes shut, and thus obtain an idea of the division of space; that it is by noting the relations of the different objects which we see, near and far, that we obtain a conception of universal space.

Metaphysics is a science of delicate perceptions and a strict definition of terms. What is customarily meant by looking into space, is looking at the sky, and the sky is an optical illusion. If the atmosphere had no color we should see nothing there except the clouds. It is true that we can look through a glass, and that glass is an objective reality; but we cannot at the same time look through an object and be conscious of its existence,

unless we also see it. Unless we perceive that glass is glass, we are liable to knock our heads against it, as birds do in a conservatory. We commonly perceive reflections on the glass, or the green color at its edges, which prevent our doing this; but there are no reflections or coloring which assist us to determine the objectivity of space. These are proverbial expressions which cannot prudently be used as the terms of a syllogism in philosophy. The same is true of measuring spaces, on a wall, or clock, or any flat surface. What is meant properly in this case is *distance*, and not space in the abstract. Now distance is linear, but space extends in every direction; it might be called an abstract universal polygon. Marking distances on a plane surface will assist us to obtain a conception of number, but not a conception of space. Shall we not conclude, therefore, that space is not an objective reality, as air and water are objective realities?

Herbert Spencer would seem to have been half conscious of this, for we soon afterwards find him defining space as "an ability to contain bodies."

Ability, however, is a force,—light is an ability of combustion, and electricity is an ability,—and a necessity of all forces is that they should be present in one place and absent in another; whereas space is, as above mentioned, present everywhere, and always in an equal degree. No writer has ever contended that space was a force, physical or mental.

Herbert Spencer, indeed, begins with the assumption that there is occupied space and unoccupied space,—that is, bodies and *vacua*; but he soon loses

sight of this distinction, and writes as if space and the atmosphere were synonymous terms. This is the common materialistic mistake in considering the subject. There is space for human beings in the atmosphere, because it is our element; but the atmosphere is a body as well as the earth, and if space is likewise an objective reality it is difficult to understand how the two can coexist in the same place. A metal bar charged with electricity might seem an exception to this, but all metals are more or less porous, and even the densest can be penetrated by the electric fluid just as granite absorbs water. The attempt to materialize space, like the materialization of spirits, must always result in a contradiction of this sort. If there is space in one body there must be in another, even if the first is a gas and the second a solid. If there is space in the atmosphere there must also be space in the earth, and space in a cannon-ball. Now a cannon-ball may be galvanized, but another objective reality can coexist in it only after a hole has been bored in the metal. This would seem to reduce the objective reality of space to an absurdity. On the other hand, if space only exists in a vacuum, it may fairly be contended that we neither know nor can we learn anything about it. Some astronomers believe that there is no such thing as an absolute vacuum, but that the universe is filled with gases in a finely attenuated condition.

The truth would seem to be that space and time are *mental forms of measurement*, and have no objective reality whatever. The subject goes back to

Plato's *forms*, which really lie at the base of all metaphysical inquiry. Everything created by man is composed of two distinct elements,—an objective material and a subjective or intellectual form. Thus a yardstick is an objective reality, but it contains a subjective element, the yard, which taken by itself has only a subjective existence. This becomes more apparent when we consider a mile, a degree, or any larger form of measurement, which never receives a concrete form. It is the same with all other methods of measuring distance or extension ; and space, which might be defined as universal extension, is the most abstract conception of this class, and is the most purely and absolutely mental. All universal conceptions, like all generalizations, are mental and subjective; for in external nature we only meet with individual and particular objects, which the mind classifies by a mental method. The word universe itself is used as an intellectual abstraction.

Considered relatively there is space for a man in the atmosphere, for a fish in water, for a borer in wood, and for angle worms in the earth.

What is commonly intended by space, is either room to breathe, live, and move in, or the prospect subtended by the angle of vision; and there is a significant relation between these two meanings. That our notion of space is called into activity by the external world cannot be doubted, but like genius it must be in us before it ever could come out. The same may be said of language. Even an unlimited series of external impressions could never

have brought the language of the human race into existence, unless we had already been endowed with the faculty for it. A scientific investigation in either case would have little value, since we are too remote from the period in which we acquire our first perceptions of space and time to obtain accurate data concerning them. We can only reason about them, as we reason concerning the constitution of the sun and the planets. This much, however, is certain, that the infant child becomes conscious of space as soon as he opens his eyes, just as he becomes conscious of an external world by the sense of touch. The knowledge is immediate and continuous, for doubt is an intellectual process which can only arise at a later stage of his growth. In order to doubt we must have experience of error. It certainly seems as if a child must realize separation at the first sight, and even if the object before him is but a few feet away he must be conscious that it does not touch him, as those things do which he feels with his hands and body. At all events he learns this very quickly, and does not require repeated experiments, like a natural philosopher, to become convinced of it.

This visual angle is what we customarily mean when we speak of space. If we go into a dark room where our eyesight no longer avails and we are obliged to feel our way, we still have the recollection of space to prevent our losing the sense of it; and not alone that, but the fact that only our hands and feet are in contact with external objects—for we do not feel the atmosphere—shows us that there must

be space around us, without the assistance of eyesight. Indeed, the sense of space, having once originated, never can leave the human mind unless we are being drowned, or smothered in some other manner, when we return to the antecedent condition of the child before his eyes are opened, and the two different meanings in which space is accepted become reconciled.¹ It is probable that persons born blind also acquire a sense of space through unimpeded motion.

Space can only exist by division into spaces, and these divisions are of human invention. Infinite space would be simply nothing. It is impossible to conceive that space has a limit or that it is without a limit; for as it exists only in thought its limitations can only be those which are imposed by the individual at any particular time. What there may be beyond the range of human observation in the external world we cannot know, and it is quite useless to speculate. An infinity of thought is one thing, but an infinity of matter is another, and the human mind shrinks from the contemplation of it.

Space might be described as an imaginary sphere with an infinite radius; but this infinity is subjective and not objective. An objective infinity would in this case result in the subordination of mind to matter and the extinction of organic life. Dr. C.

¹ De Quincey's testimony in regard to space and time under abnormal conditions, is worth nothing, for he is hardly a trustworthy witness. His description of a night under the influence of opium, in which he seemed to live seventy years, and beheld a sea of human faces, is a plagiarism, perhaps unconscious, from Shakespeare's *Richard III.*, where it will be found in the prison scene of Clarence.

C. Everett says: "Space is simply the possibility of infinite extension, or, what is the same thing, the infinite possibility of extension. Space is in itself nothing. If you imagine an object struck out of existence, and nothing to take its place, that nothing would be called space."¹ Space as an objective reality would be a materialized chimæra.

WHAT IS TIME ?

As space has been defined as infinite extension, so time may be termed infinite intension. It is the form of measurement which we adopt for our internal life. Space is not an objective reality, but it has an objective application, whereas the application of time is originally subjective. I do not think, however, that the sense of time results from the sequence of our intellectual operations, but rather from the repetition of the same idea or necessary consideration.² So long as man lives in a purely animal condition, one day is like another, and there is no occasion for counting them; but as soon as he seeks to improve his mode of life, the necessity of time arises so that he may regulate his life by it. The sun and moon do not mark time for us, but we make use of them as measures of time. That this is the case is evident from the fact that we correct the slight aberrations of the sun and moon, in order to obtain mathematically perfect divisions of time. There is always this close relation between the subjective and the objective in practical affairs, for man

¹ Everett's *Science of Thought*.

² As, for instance, the necessity of obtaining food at regular intervals.

is continually obliged to adapt his life to external changes over which he has no control; and it is this which has so often deceived philosophers in regard to the true source of his mental cognitions; but it should be remembered that if the long periods of time are derived from the revolutions of the earth, its smaller divisions into hours, minutes, and seconds are purely arbitrary.

It is a popular mistake to suppose that time extends to eternity. If time were to cease, eternity would begin; but in such case time would be limited, would not extend to infinity. Eternity is really the antipodes of time, or, as John Weiss said, "Eternity is *now*,"—a perpetual now. Time may therefore be described by an imaginary line extending from the eternal to the infinite.

The first cognition of a new-born child is that of *life*, which comes with his first scream. The next is objectivity — what Professor James calls "otherness." The child's third cognition must be that of objective *self*, derived from the sense of hunger; and its fourth that of space, from sight or the free movements of its limbs; and its sense of *time* is probably derived from the repeated sensations of hunger. These experiences are, however, purely subjective.

Time and space are brought into relation with one another through motion. Of space considered in the abstract, there can be no motion, but motion produces a sense of distance which is one of the attributes of space, and lapse of time produces a sense of motion. It is thus that distances, mis-called spaces, serve to represent the lapse of time on

a clock; but even the face of a clock could not properly be called a space, for, as before stated, space extends in every direction. By no effort of the imagination can space be reduced to a single line, straight or curved, and therefore all attempts to convert time into space will invariably end in a confusion of language. Intension cannot be converted into extension. We speak of a day's journey to indicate the time we have spent in travelling, but the earth's surface is never measured in that manner. So also in Switzerland, travelling is estimated by hours, because the country is so uneven that a statement in miles would afford no adequate impression of the journey. Time is measured by distances, but no railroad train is sufficiently accurate to measure distance by time. Only the revolutions of the earth and planets—no human invention—can be made to serve that purpose.

It is impossible to conceive of time as extending like space in every direction. It extends backward to infinity and forward to infinity,—or rather from the inconceivable to the inconceivable. It might be symbolized by a straight line with $\frac{m}{o}$ at either end. This is a grand idea, for it affords an intimation of a higher intelligence than we mortals possess, to which such a fact can be plainly perceptible.

As Kuno Fischer observes, the whole science of mathematics is founded on space and time.¹ Space gives us addition and subtraction; time, multiplication and division. Multiplication results from the repetition of the same spatial quantity, and, as has

¹ Fischer on *Kant's Kritik*, p. 49.

already been stated, it is this repetition of a mental cognition which gives us the sense of time. If the spaces are unequal, time cannot affect them except by obtaining a new form of measurement. Multiplication equals time plus addition. Now a pure mathematics is an *a priori* science, an emanation of the intellect which has no objective reality. Numbers are abstract types.

There are no grand ideas in Herbert Spencer's psychology; as there never can be in a materialistic philosophy. It is true that he realizes that the quality of space and time has some peculiarity which it is not easy to explain on the principles he has adopted. He says (page 25): "Exception may be taken to this argument on several grounds—on the ground that space and time, *taken in the abstract*, are not strictly conceivable things in the sense that other things are." Here he evidently has obtained an intimation of the truth, but he closes his mind to it in order to hold fast to his preconceived opinions of mental evolution. Time and space are subjective realities, or they could not be conceived in the abstract. It is impossible to conceive the sun, a tree, a lion, or any other purely objective reality in the abstract. A man may be considered in the abstract in his subjective intellectual capacity, but not in his objective animal capacity. A lion, also, may be treated abstractly in art, for art always contains the subjective element; and, moreover, art and metaphysics are two very different subjects. Everything created by man, if it be only a rude boundary mark, contains this union of the subjec-

tive and objective, which distinguishes it in kind from the purely natural. Man is at once his own object and subject. "The great first cause" might be defined as infinite subjectivity.

The English and Scotch schools of philosophy have long been in opposition in regard to the reality of the external world. This time-honored discussion may have borne its fruit in the German philosophy of reconciliation, but it has always seemed to me a needless form of inquiry. What difference does it make, so long as we are obliged to deal with the external world as a reality, whether in itself it is real or imaginary? The true question ought to be, What do we know of matter, and what do we know of mind, as distinguished from it? In Plato's time more was probably known about mind than matter, but Aristotle soon after gave a powerful impetus to the investigation of physical causes. The truth would seem to be that in the beginning men knew nothing of either, but that we are gradually finding out the quality and attributes of both. All the physical sciences are exemplifications of matter, and help to instruct us what it is in itself. Much has been accomplished in this direction, and much still remains to be done. In like manner the whole science of mathematics, as well as metaphysics and ethics, are illustrative of mind, and instruct us concerning its true nature. We might even assert that he who is not capable of perceiving that mind is a reality as much as the ground under his feet, is not fitted for the study of metaphysics. The philosopher who stated that mind and matter are sepa-

rated by the whole diameter of being, was right in one sense, but does not seem to have realized that they are perpetually in contact, and often so closely united that many well educated persons are unable to think of them separately.

The novelty of Spencer's philosophy is his introduction of Darwinian evolution as an explanation of the growth and development of intellectual life. This has its value, and there are portions of his work on psychology which no living writer on the subject can afford to disregard; but his attempt in this direction also fails of completeness because he passes over the origin of consciousness. That marks a barrier between man and the brute, which no scheme of physical evolution can explain; for physical evolution is not in any manner required for it. The Darwinian theory serves very well as a physical explanation of the origin of mankind, but it makes his intellectual development all the more difficult to understand. The origin of consciousness probably coincided with the origin of language, for one necessitates the other; and if the intellectual development of the lower animals coincided with their physical development, we should expect to find more highly developed faculties in the family of apes than among dogs and elephants; but the reverse of this would seem to be the case. Would we not also be justified in expecting a higher degree of rudimentary language among apes than other classes of animals? No evidence has been discovered, however, to prove that there is any further communication between apes than between a hen

and her chickens. The cries of animals are all interjections, and we have obtained no testimony as yet to show that any animal makes use of a definite sound with reference to a particular object; which, after all, is what constitutes language. This is the weak side of the Darwinian theory, and its advocates in England and America try to avoid it as much as possible. Even if the Darwinians succeed in bridging this chasm at a future time, the transition from inorganic to organic matter will still remain to be explained. If we even suppose that the tendency to language and self-consciousness was involved in the nerve-cells of the very lowest organism, by what means or power did those nerve-cells originally come to exist? This we do not know, nor is it likely that we shall ever discover it, so long as we are mortal men, but it is a metaphysical fact of the highest importance that no student of philosophy can safely disregard. The most elaborate schemes, the most ingenious system of thought, will ultimately come to nothing unless this element be included. The mathematician is constantly obliged to deal with the infinite and the indeterminate, although he can have but a faint conception of the significance of either. So, likewise, the philosopher is obliged to deal with existence in its twofold form, animate and inanimate, and make use of both as factors in his reasoning, although they still remain to him incomprehensible. They are difficult factors to deal with, and make the subject more difficult to understand, but it will not do to shun them or evade the conclusions which they force upon us.

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